

I CLAIM AS MY INVENTION:

1. An implantable biventricular cardiac stimulating device comprising:
 - a housing adapted for implantation in a living subject;
 - a pulse generating circuit contained in said housing for generating pacing pulses each having an energy content;
 - a first electrode connected to said pulse generating circuit and adapted for positioning to interact with a first ventricle of the heart of the subject to deliver said pacing pulses thereto;
 - a second electrode connected to said pulse generating circuit adapted for positioning to interact with a second ventricle of the heart to deliver said pacing pulses thereto;
 - a control circuit connected to said pulse generating circuit for controlling operation of said pulse generating circuit to control delivery of said pacing pulses to said first and second ventricles;
 - a further electrode connected to said control circuit and adapted for positioning in the subject at a distance from the heart; and
 - said control circuit sensing, via said further electrode, at least one intracorporeal ECG signal after delivery of pacing pulses to said first and second ventricles, respectively, and said control circuit analyzing at least one characteristic in said intracorporeal ECG signal to determine whether a loss of capture has occurred on either of said first and second electrodes.
2. An implantable biventricular cardiac stimulating device as claimed in claim 1 wherein said control circuit analyzes said intracorporeal ECG signal to

determine on which of said first and second electrodes said loss of capture has occurred.

3. An implantable biventricular cardiac stimulating device as claimed in claim 2 wherein, if said loss of capture has occurred, said control circuit adjusts the energy content of said pacing pulses to eliminate said loss of capture.

4. An implantable biventricular cardiac stimulating device as claimed in claim 1 wherein said control circuit analyzes a QRS duration in said intracorporeal ECG signal as said characteristic.

5. An implantable biventricular cardiac stimulating device as claimed in claim 1 wherein said control circuit analyzes QRS morphology in said intracorporeal ECG signal as said characteristic.

6. An implantable biventricular cardiac stimulating device as claimed in claim 5 wherein said control circuit analyzes said QRS morphology by comparing the QRS morphology in the sensed intracorporeal ECG signal to stored data to identify said QRS morphology as indicating biventricular capture, right ventricular capture or left ventricular capture.

7. An implantable biventricular cardiac stimulating device as claimed in claim 1 wherein said control circuit analyzes a sequence of positive and negative peaks in said intracorporeal ECG as said characteristic.

8. An implantable biventricular cardiac stimulating device as claimed in claim 1 wherein said control circuit analyzes a sequence of positive and negative slopes in said intracorporeal ECG signal as said characteristic.

9. An implantable biventricular cardiac stimulating device as claimed in claim 1 wherein said control circuit analyzes said intracorporeal ECG signal for a presence or absence of a visible ST segment as said characteristic.

10. An implantable biventricular cardiac stimulating device as claimed in claim 1 wherein said control circuit employs said housing as an electrode, in combination with said further electrode, for sensing said intracorporeal ECG signal.

11. An implantable biventricular cardiac stimulating device as claimed in claim 1 wherein said further electrode comprises a short non-endocardial electrode lead.

12. An implantable biventricular cardiac stimulating device as claimed in claim 1 comprising at least one electrode dot disposed on said housing, and wherein said control circuit uses said at least one electrode dot, in combination with said further electrode, for sensing said intracorporeal ECG.

13. An implantable biventricular cardiac stimulating device as claimed in claim 1 wherein at least one of said first and second electrodes is a tip electrode of endocardial electrode lead, and wherein said further electrode comprises a ring electrode disposed on said endocardial lead and wherein said control circuit senses said intracorporeal ECG between said ring electrode and said tip electrode.

14. An implantable biventricular cardiac stimulating device as claimed in claim 1 wherein said control circuit operates said pulse generating circuit to deliver at least one back-up pulse to at least one of said first and second ventricles if said analysis of said intracorporeal ECG signal indicates a complete loss of capture.